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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/989,273	11/20/2001	William Robert Hanson	035451-0145 (3682.Palm)	9592
26371	7590	09/22/2004	EXAMINER	
FOLEY & LARDNER 777 EAST WISCONSIN AVENUE SUITE 3800 MILWAUKEE, WI 53202-5308			SAWHNEY, HARGOBIND S	
			ART UNIT	PAPER NUMBER
			2875	

DATE MAILED: 09/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/989,273

Applicant(s)

HANSON ET AL.

Examiner

Hargobind S Sawhney

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 30 June 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

1. The brief on appeal filed on June 30, 2004 has been entered.
2. Based on the review of the appeal brief and further examination, the finality of that action is withdrawn. The following non-final rejections substitutes the final rejection mailed on November 3, 2003.

### ***Claim Objections***

3. Claim 6 is objected to because of the following informalities:

Claim 6, line 1: "reflective layer" needs to be rephrased as —the reflective layer—to indicate that it is the same element which is recited in the base Claim 1.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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5. Claims 1, 2, 4 and 6-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen (U.S. Patent No. 5,982,092) in view Baur et al. (U.S. Patent No. 4,142,781).

Regarding claim 1, Chen ('092) discloses a lighting system for a display (Figure 3) comprising:

- a light source system including a light source 40 providing light not visible to the human eyes (Figure 3, column 1, lines 10-14, and column 3, lines 43-45);
- a reflective layer- combination of the fluorescent pigment layer 50 optically in contact with the reflecting layer 30- herein after referred as the reflecting layer 50,30 (Figure 3, column 3, lines 5-7 and 11-20);
- the reflective layer 50,30 reflecting invisible light from the light source 40, and converting the invisible light into light visible to human eyes (Figure 3, column 3, lines 5-7 and 11-20);
- a display layer having pixels alterable with application of electrical charge – interpreted as a liquid crystal display (LCD) (not shown, column 1, lines 17-20) well known in the art, and as evidenced by Baur et al. (U.S. Patent No. 4,142,781);
- the display layer being illuminated by visible light from the reflective layer 50,30 (not shown, column 1, lines 17-20);

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- the light source 40 located below the display layer – the lighting system operating as a back light source not shown, column 1, lines 17-20);

However, regarding Claim 1, Chen ('092) does not disclose a light source including a reflective layer having a phosphorescent.

On the other hand, Baur et al. ('781) discloses an electro-optical display device (Figure 9) comprising a fluorescent plate 1a, and an additional phosphorescent coating - a layer 25 containing phosphorescent particles- (Figure 9, column 9, lines 5-10).

It would be have been obvious to one of ordinary skill in the art at the time of the invention to modify the lighting system of Chen ('092) by providing the phosphorescent coating as taught by Baur et al. ('781) for the benefits and advantages of amplifying the brightness of the display device, and for providing afterglow of the display after the device in switched-off.

Regarding claims 2, 4 and 7-9, Chen ('092) in view Baur et al. ('781) discloses the lighting system (Figure 3) further including;

- a light guide 10 (Chen, Figure 3, column 2, line 54);
- the light source 40 being a single light source, and being a light emitting diode (LED) 40 (Chen, Figure 3, column 3, lines 11-13);
- the reflective layer 50,30 including fluorescent coating 50 (Chen, Figure 3, column 3, lines 5-7 and 11-20) on a substrate;
- the light source providing an ultraviolet (UV) light (Chen, Figure 3, column 1, lines 9-12, and column 3, lines 34-38);--

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Regarding Claim 6, Chen ('092) discloses a lighting system including a reflective layer on a substrate. However, Chen ('092) does not specifically teach the reflective layer including metallic coating. It would be have been obvious to one of ordinary skill in the art at the time of the invention to modify the lighting system of Chen ('092) by providing a reflective surface (aluminum mirror surface) with metallic coating well known in the art, and as evidenced by Baur et al. ('781) in Claim 8.

6. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chen (U.S. Patent No. 5,982,092) in view Baur et al. (U.S. Patent No. 4,142,781) as applied to claim 1 above, and further in view of Vossler (U.S. Patent No. 5,856,819).

Chen ('092) in view of Baur et al. ('781) teaches a light source 40 providing light having wavelength in a spectrum not visible to the human eyes (Figure 3, column 1, lines 10-14, and column 3, lines 10-14). However, neither combined nor individual teaching of Chen ('092) and Baur ('781) specifically teaches the light source providing infrared (IR) light.

On the other hand, Vossler ('819) discloses a bi-directional presentation display 10 (Figures 1 and 2) illuminated with an IR light source – alternate to the light tube 70- (Figure 5, column 5, lines 44 and 49-57).

It would be have been obvious to one of ordinary skill in the art at the time of the invention to further modify the lighting system of Chen ('092) in view of Baur ('781) by providing the IR-based lighting system as taught by Vossler ('819) for the benefits of making it usable in dark or at night with night vision equipment.

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7. Claims 10-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen (U.S. Patent No. 5,982,092) in view Vossler (U.S. Patent No. 5,856,819).

Regarding Claim 10, Chen ('092) discloses a lighting system for a display (Figure 3) comprising:

- a light source system including a light source 40 providing light not visible to the human eyes (Figure 3, column 1, lines 10-14, and column 3, lines 43-45);
- a reflective layer- combination of the fluorescent pigment layer 50 optically in contact with the reflecting layer 30- herein after referred as the reflecting layer 50,30 (Figure 3, column 3, lines 5-7 and 11-20);
- the reflective layer 50,30 reflecting invisible light from the light source 40, and converting the invisible light into light visible to human eyes (Figure 3, column 3, lines 5-7 and 11-20);
- a display layer having pixels alterable with application of electrical charge – interpreted as a liquid crystal display (LCD) (not shown, column 1, lines 17-20) well known in the art, and as evidenced by Baur et al. (U.S. Patent No. 4,142,781);
- the display layer being illuminated by visible light from the reflective layer 50,30 (not shown, column 1, lines 17-20);

However, Chen ('092) does not specifically teach a display layer being illuminated by infrared light. Instead, Chen ('092) makes the use of ultraviolet light source for illumination of the display layer.

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On the other hand, Vossler ('819) discloses a bi-directional presentation display 10 (Figures 1 and 2) illuminated with an IR light source – alternate to the light tube 70- (Figure 5, column 5, lines 44 and 49-57).

It would be have been obvious to one of ordinary skill in the art at the time of the invention to further modify the lighting system of Chen ('092) in view of Baur ('781) by providing the IR-based lighting system as taught by Vossler ('819) for the benefits of making it usable in dark or at night.

Regarding Claim 11, Chen ('092) in view of Vossler ('819) discloses a lighting system including a source of light. However, neither combined nor individual teaching of Chen ('092) and Vossler ('819) specifically discloses the light source being a light emitting diode (LED). On the other hand, use of LEDs for visible as well as infrared light is well known in the art as evidenced in Yamashita (US Patent No.: 4,599,537) for its compactness, long operational life and high-energy efficiency.

It would be have been obvious to one of ordinary skill in the art at the time of the invention to further modify the lighting system of Chen ('092) by providing the LED as light source well known in the art for the benefits its compactness, long operational life and high-energy efficiency.

Regarding Claim 12, Chen ('092) in view of Vossler ('819) discloses a lighting system including an LCD with a display element. However, neither combined nor individual teaching of Chen ('092) and Vossler ('819) specifically discloses the display element being flexible. On the other hand, use of flexible liquid crystal display is well



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known in the art as evidenced in Lueder (US Patent No.: 6,559,918 B1) or Wakita et al. (US Patent No.: 5,307,190).

It would be have been obvious to one of ordinary skill in the art at the time of the invention to further modify the lighting system of Chen ('092) in view of Vossler ('819) by providing the Flexible as light source well known in the art for the benefits of improved mechanical stability and displaying massages in multi-dimensional frame.

Regarding claims 13-15 Chen ('092) in view of Vossler ('819) discloses a lighting system further including:

- the light source being positioned behind the display element (not shown, Chen, column 1, lines 17-20);
- the reflective layer including metallic (aluminum mirror surface) surface well known in the art, and as evidenced in claim 8 of Baur et al. ('781);
- the display element being an LCD (Chen, not shown, column 1, lines 17-19);

Regarding claim 16, neither combined nor individual teaching of Chen ('092) and Vossler ('819) teach lighting system illuminating electronic paper(e-paper) displays.

It has been held that a recitation with respect to the manner in which a claim apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitation.

8. Claims 17-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue et al. (U.S. Patent No. 5,677,702).

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Regarding Claim 17, Inoue et al. ('702) discloses a display system (Figures 2 and 7) comprising:

- a light source 4 providing invisible light over a definite region (Figure, column 3, line 65);
- a light guide 1 dispersing the invisible light over a defined period (Figure 2, column 3, line 28;
- a light converter 3a converting the invisible light to visible to the human eye (Figure 2, column 3, lines 49-55)
- the light converter 3a reflecting visible and invisible light (Figure, column 3, lines 52-55), and further including a phosphorescent coating on a substrate of the converter 3a (Figure 2, column 4, lines 4-7);
- a flexible display 7 receiving and transmitting visible light (Figure 7, column 6, line 48-52);

Although, Inoue et al. ('702) teaches a light converter converting invisible light to visible light, and reflecting visible and invisible light, Inoue et al. ('702) does not specifically teach the light converter including metallized coating.

It would be have been obvious to one of ordinary skill in the art at the time of the invention to realize the need of metallized coating on the converter for it to reflect visible light which is well known in the art , and as evidenced in Baur et al (US Patent No.: 4,142,781)

Regarding claims 18, 24 and 27, Inoue et al. ('702) discloses the display system (Figures 2 and 7) further comprising;

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- the light guide 1 overlaying the flexible display layer 7 (Figure 7);
- the light source 4 and the light guide 1 forming a front lighting system (Figure 7);
- the light source 4 providing ultraviolet (UV) light (Figure 2, column 3, lines 65-67;

However, regarding claims 19 and 25, Inoue et al. ('702) does not teach the display system having a back lighting system including a flexible display layer overlaying the light guide. On the other hand, Inoue et al. ('702) teaches a front lighting system having a light guide overlaying the flexible display layer.

It would be have been obvious to one of ordinary skill in the art at the time of the invention to modify the display system of Inoue et al. ('702) by positioning the flexible display layer overlaying the light guide, since it has been held that rearranging parts of an invention involves only routine skill in the art.

9. Claims 22 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue et al. (U.S. Patent No. 5,677,702) in view of Hajto (U.S. Patent Application Pub. No. US 2004/0100432 A1) herein after referred as Hajto.

Regarding, claims 22 and 26, Inoue et al. ('702) discloses the display system (Figures 2 and 7) comprising an invisible light source and a light converter having phosphorescent coating. However, Inoue et al. ('702) does not specifically teach:

- the light source being a light emitting diode(LED); and
- the light converter including fluorescent coatings.

On the other hand, Hajto discloses a display system (Figure 3) comprising:

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- the light source 20 being a light emitting diode(LED) (Figure 3, Para. 0052); and
- the light converter 12 including both fluorescent and phosphorescent material coatings (Figure 3, Para. 0052).

It would be have been obvious to one of ordinary skill in the art at the time of the invention to modify the display system of Inoue et al. ('702) by providing:

- a light emitting diode (LED) as a light source as taught by Hajto for the benefits and advantages of high efficiency compactness and long operational life;
- the light converter with fluorescent coating for the benefits of making use of an LED emitting ultraviolet or blue light for cost effective operation of the device.

### ***Response to Amendment***

10. Applicant's arguments filed on June 30, 2004 with respect to the 35 U.S.C. 103(a) rejections of claims 1-27 have been fully considered but they are not persuasive.

Argument: Regarding the amended claims 1-4,6-9, 17-19, 22 and 24-27, it is unclear how the statement " benefits and advantages of providing afterglow of the display after the device power is switched-off"

provides motivation to combined the teaching Baur et al. with those of Chen.

Response: The use of phosphorescent material for conversion of invisible light to visible light is well known in the art. Baur et al. further teaches that the portion of the light not absorbed by the fluorescent plate gets absorbed by the phosphorescent material, which can additionally excite the fluorescent material producing afterglow of the device (Column 9, lines 11-21).

Argument: Regarding Claim 1, how the device of Chen would be modified in order to accommodate the fluorescent plate 1a of Baur?  
Regarding Claim 1, how the device of Chen would be modified in order to accommodate the various features of the LCD of Umemoto?

Response: The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. Thus, based on the teaching of Baur, one of ordinary skill in the art at the time of the invention would have been motivated to modify the device of

Chen for efficient conversion of invisible light to visible light, and for producing afterglow of the device.

Argument: Regarding Claim 1, there is no teaching or suggestion that the “fluorescent pigment layer 50” is a coating. In contrast, Chen states that the “fluorescent pigment layer in interposed between the light conductive plate 10 and reflection layer 30.

Response: A layer in optical contact with the reflection layer 30 (Chen) has been broadly interrelated as a coating.

Argument: “The reflection layer 30” and the “fluorescent pigment layer 50” appears to be two separate components of the device disclosed by Chen, as opposed to “ a phosphorescent coated surface” recited in Claim 1.

Response: A fluorescent pigment layer 50 in optical contact with the reflection layer 30 (Chen) has been broadly interrelated as a single layer.

Additionally, it would be have been obvious to one of ordinary skill in the art at the time of the invention to make “The reflection layer 30” and the “fluorescent pigment layer 50” integral, since it has been held that forming in one piece an article which has formerly been formed in two pieces and put together is a merely a matter obvious engineering choice, and involves only routine skill in the art.

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Argument: Regarding claims 10-27, the combination of Chen, Baur et al., and Umemoto does not meet the limitations.

Response: Applicant's arguments are moot in view of the new ground(s) of rejections detailed above.

### ***Conclusion***

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Gettemy et al.(US Patent 6,536,933 B1), Hashimoto et al. (US Patent Application Pub. No.: US 2002/0003711 A1), Rockwell, III (US Patent 5,596,671) , Lengyel (US Patent 5,579,134), Prince et al. (US Patent 5,146,355), Yamashita (US Patent 4,599,537) and Macovski (US Patent 4,059,767)

Each of the above-indicated prior arts discloses a display combined with a lighting system comprising some of the features claimed by the applicant.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hargobind S Sawhney whose telephone number is 703-306-5909. The examiner can normally be reached on 6:15 - 2:45.

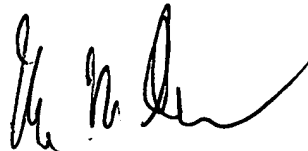
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sandra O'Shea can be reached on 703-305-4939. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9306/7724 for regular communications and 703-872-9319 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-2956.

HSS

9/17/2004

A handwritten signature in black ink, appearing to read 'T. M. Sember', with a long horizontal flourish extending to the right.

**THOMAS M. SEMBER  
PRIMARY EXAMINER**